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May 13, 2022

**VIA ELECTRONIC FILING**

The Honorable Jocelyn G. Boyd  
Chief Clerk and Executive Director  
Public Service Commission of South Carolina  
101 Executive Center Drive, Suite 100  
Columbia, SC 29210

**Re: Joint Petition of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC to Establish a Consolidated Informational Docket for Review and Consideration of Grid Improvement Plans (NDI Opened Pursuant to Commission Order No. 2020-533) Docket No. ND-2020-28-E**

**Informational Update on Stakeholder Meeting Held May 12, 2022**

Dear Ms. Boyd:

On August 12, 2020, by Order 2020-533 in Docket No. 2019-381-E, the Commission approved Duke Energy Carolinas, LLC's ("DEC") and Duke Energy Progress, LLC's ("DEP") (collectively, the "Companies") joint request to establish an informational docket for review and consideration of its Grid Improvement Plan ("GIP"). As a result of that order, on August 14, 2020, the Commission opened the above-referenced NDI docket.

On April 4, 2022, the Companies filed the 2021 SC GIP Status Reports for DEC and DEP. These reports showed how the Companies are performing in terms of program costs and units compared to its targets. The Narrative summary filed with the reports elaborated on SC GIP key accomplishments from 2019-2021.

On May 12, 2022, the Companies held a South Carolina Grid Improvement Plan 2021 Status Report virtual forum. During this session, subject matter experts discussed select 2019-2021 SC GIP accomplishments as well as program and project specific highlights. Presenters were available for questions submitted during the forum. The Companies appreciated the engagement from stakeholders who attended.

The Honorable Jocelyn G. Boyd  
May 13, 2022  
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The following attachments enclosed with this update provide additional information on the virtual forum.

- Attachment A: Invitation to Virtual Forum
- Attachment B: Invitation Distribution List
- Attachment C: List of External Attendees Registered
- Attachment D: List of External Attendees
- Attachment E: South Carolina GIP 2021 Virtual Forum Presentation
- Attachment F: Virtual Forum Follow-Up Survey

The Companies will continue to inform stakeholders, the ORS and the Commission on developments in the Companies' GIPs.

Sincerely,

Camal O. Robinson

#### Attachments

cc: (via email w/ enclosure)  
Counsel for Office of Regulatory Staff  
Department of Consumer Affairs  
Counsel for Sierra Club  
Counsel for Walmart, Inc.  
Counsel for SELC on behalf of SC NAACP, SCCCL & Upstate Forever  
Counsel for Nucor Steel-South Carolina  
Counsel for SCSBA and Cypress Creek Renewables  
Counsel for SCEUC  
Counsel for Vote Solar  
Counsel for CMC Recycling  
Hasala Dharmawardena

**Underwood, Lizzy**

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**From:** GIP-engagement  
**Sent:** Tuesday, April 5, 2022 10:37 AM  
**Subject:** You are invited! 05/12 Duke Energy Virtual Forum - 2021 SC GIP Status Report



Good morning,

Duke Energy's Grid Improvement team would like to invite you to a virtual forum on May 12<sup>th</sup>, 2022 from 1:30 – 3:00 p.m. The purpose of the forum is to update interested stakeholders on the Grid Improvement Plan's continued progress, provide program and project highlights, listen to your feedback, and respond to questions you may have. In Docket No. ND-2020-28-E, you can find the [2021 SC GIP Status Report Documents](#), which were filed on April 4<sup>th</sup>.

If you wish to participate in the virtual forum, we ask that you please register by Monday, May 9<sup>th</sup> using this link: [Register here!](#)

Prior to May 12<sup>th</sup>, you will receive an e-mail with the details for joining the Microsoft Teams meeting.

For assistance with registration, please email: [Eventsupport@duke-energy.com](mailto:Eventsupport@duke-energy.com). If you have any questions, need additional information or to request a topic to be covered in the forum, please feel free to reach out to [GIP-Engagement@duke-energy.com](mailto:GIP-Engagement@duke-energy.com).

Thank you very much for your continued interest in Duke Energy's Grid Improvement Plans, and we hope that you will join us on May 12<sup>th</sup>!

**Melissa Chandler Murphy**

Director, Stakeholder Engagement

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# THANK YOU FOR JOINING US.

The Virtual Forum will be starting shortly.



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## TODAY'S AGENDA



Meeting Logistics and Presenters



Megatrends and Key Accomplishments



Program and Project Highlights - Transmission



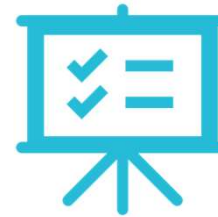
Program and Project Highlights - Distribution



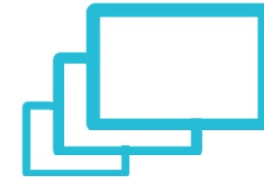
## MEETING LOGISTICS



This meeting will not be recorded by Duke Energy, and we ask that attendees do not record as well.



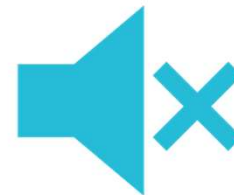
The presentation will be filed with the Commission after this session.



For optimal viewing of the presentation, please maximize the window by clicking the ellipsis at top, scrolling down and selecting “Full Screen.” To minimize, de-select “Full Screen.”



For technical difficulties, please use the chat feature to let us know if you are having challenges seeing or hearing anything. We will be monitoring those comments and will assist you with troubleshooting by chatting with you directly.



All attendees, apart from designated speakers, are muted to mitigate background noise disruptions.



Please submit questions through the Teams meeting chat. Speakers will address questions as time allows. If you have questions aside from today’s topic or if time does not allow us to answer today, we will follow up with you directly.

## TODAY'S PRESENTERS



**Brent Guyton**  
Customer Delivery  
Carolinas



**Amy Howe**  
Transmission



**Leslie Clark**  
Customer Delivery  
Carolinas



**Kenneth McCraw**  
Customer Delivery  
Carolinas



## TODAY'S PRESENTERS



**Eugene Moore**

Customer Delivery  
Distributed Energy  
Group



**Clifton Cates III**

Customer Delivery  
Carolinas



**Sam Spilman**

Customer Delivery  
Carolinas



**Justin Brown**








Planning & Regulatory  
Support



# MEGATRENDS AND KEY ACCOMPLISHMENTS

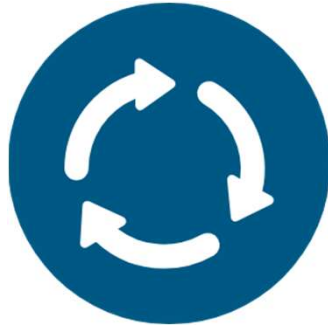
Brent Guyton  
Director, Customer Delivery Carolinas Asset Management

MEGATRENDS

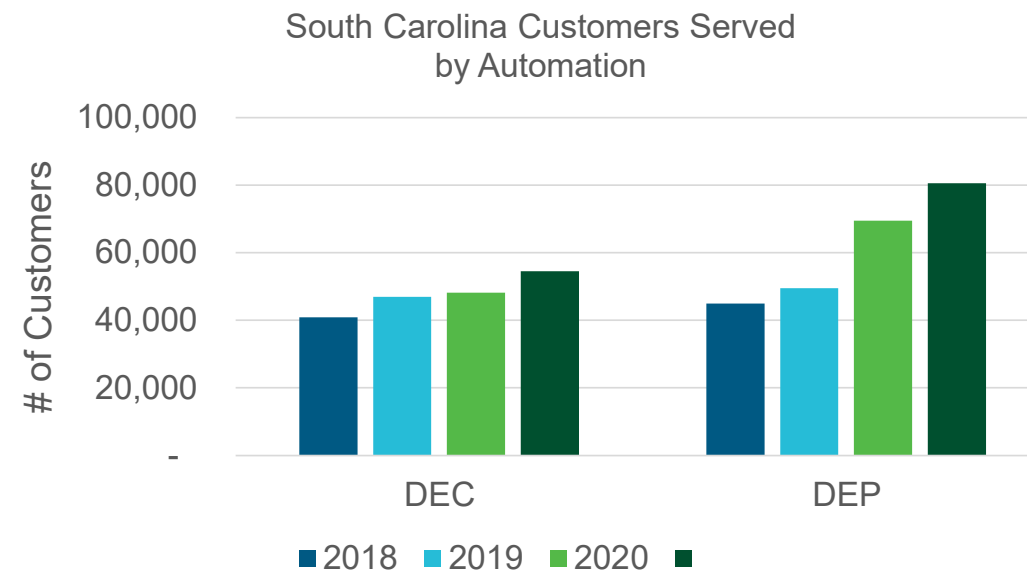
Megatrend	Description	Supporting information
 <b>Impact of weather events</b>	Increasing intensity in the number, severity and impact of weather events is leading to more outages for customers	South Carolina was impacted by a record of <b>10</b> “Billion-dollar storms” in 2020 (most in South Carolina’s history) <sup>2</sup>
 <b>Technology advancements - renewables and DERs</b>	Renewables and DERs are becoming a significant capacity resource on the grid and are expected to grow rapidly over the next few decades	Installed solar capacity in South Carolina will increase <b>17%</b> and reach <b>~4.1 GW</b> by 2025 <sup>1</sup>
 <b>Threats to grid infrastructure</b>	Purposeful threats to the electric grid are on the rise, including physical and cyber threats (e.g., ransomware, theft)	Ransomware in the US increased <b>62%</b> in 2021 <sup>3</sup> , and utility cybersecurity spending is expected to double by the end of the decade <sup>4</sup>
 <b>Environmental trends</b>	Private and public sector commitments to clean energy escalates customers’ desire for safe and reliable DER access	<b>60%</b> of Fortune 500 companies (incl. companies in SC such as BMW, Michelin, etc.) have set carbon emissions goals <sup>5</sup>
 <b>Grid improvement</b>	Grid improvement technology has advanced over the last decade, giving utilities alternatives to traditional grid infrastructure options	Advancements in tech provide new solutions; U.S. market for smart grid IT and analytics software to grow from <b>\$3B to \$6B</b> (2019 to 2028) <sup>6</sup>
 <b>Concentrated population growth</b>	Population growth is concentrating in urban and suburban areas	Three South Carolina cities are among the <b>20</b> fastest growing nationally <sup>7</sup>
 <b>Customer expectations</b>	Customers increasingly want to save money, reasonably reduce outages, and safely access clean energy options	Reliability and affordability are the most common feedback topics for Carolina's customers in a recent survey <sup>8</sup>

Source: <sup>1</sup>SEIA 2021; <sup>2</sup>NOAA 2021; <sup>3</sup>Sonic Wall 2021; <sup>4</sup>Guidehouse 2019; <sup>5</sup>World Wildlife Fund 2021; <sup>6</sup>U.S. DOE 2018; <sup>7</sup>US News & World Report; <sup>8</sup>Duke energy CXM 2020 survey

## KEY ACCOMPLISHMENTS



### SELF-OPTIMIZING GRID (“SOG”)

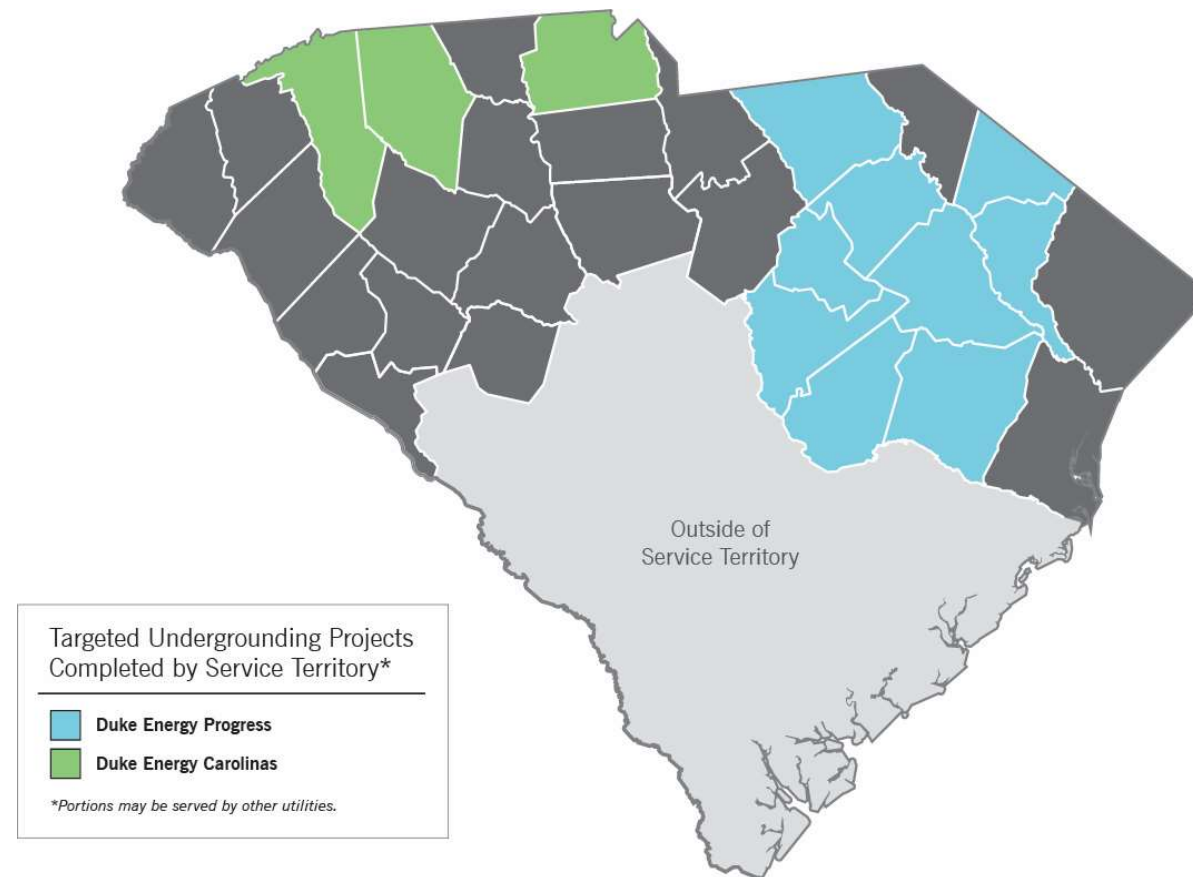


## KEY ACCOMPLISHMENTS

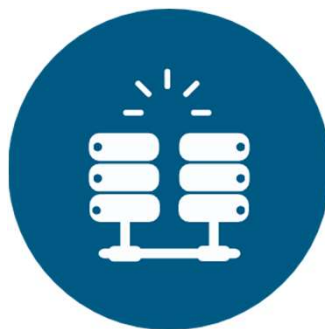


### TARGETED UNDERGROUNDING ("TUG")

- 19.5 miles in DEC and 7.4 miles in DEP of overhead conductor have been converted to underground on outage prone parts of the system
- Through December 31, 2021, projects have been completed in 12 counties across DEC and DEP territories as shown:

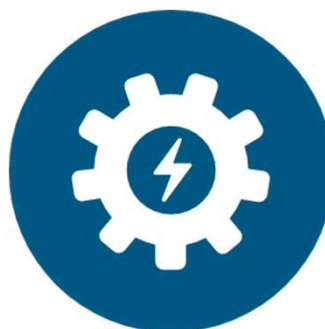


## KEY ACCOMPLISHMENTS



### INTEGRATED VOLT-VAR CONTROL ("IVVC")

Through December 31, 2021, the IVVC program has installed 18% of the capacitors, installed 67% of the regulator controls and associated load balancing efforts resulting in 116 circuits commissioned in preparation for voltage reduction.



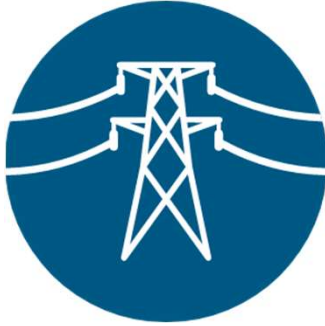
### INTEGRATED SYSTEMS AND OPERATIONS PLANNING

The Advanced Distribution Planning ("ADP") toolset achieved full-scale deployment to distribution planners in the Carolinas in August 2021.

- Deployment of ADP tools and processes are transforming distribution planning by introducing automation to improve efficiency of complex analytical processes needed for distribution-oriented investments that include distributed energy resources ("DER").
- When planning for system upgrades, ADP also facilitates the evaluation of battery energy storage systems as non-traditional solutions to serve those system growth needs and potentially defer distribution investments.



## KEY ACCOMPLISHMENTS



### TRANSMISSION SYSTEM INTELLIGENCE

Installations of intelligent communication equipment have been completed at 28 South Carolina substations (128 Carolinas system-wide).



### TRANSMISSION OIL BREAKER REPLACEMENTS

Work was accelerated to prioritize reliability and environmental improvements. Approximately 55 distribution and transmission oil breakers were replaced through December 31, 2021.



# TRANSMISSION – PROJECT HIGHLIGHTS

Amy Howe

Director, Transmission Asset Management



## TRANSMISSION LINE HARDENING & RESILIENCY

### TUXEDO A & B 44KV LINE REBUILD

- Transmission Line upgrades on the Tuxedo 44-kV circuits A and B in Spartanburg County has strengthened 10 miles.
- This improves reliability for more than 8,000 customers.



ORIGINAL WOOD H-FRAME



NEW STEEL POLE

## TRANSMISSION OIL BREAKER

### BREAKERS

The Oil Breaker replacement program isolates faults to the smallest section of the system to minimize customer outages.

- Florence West breaker replacements improves reliability for over 3,000 customers.

### KEY ACCOMPLISHMENT

Approximately **55** Transmission and Distribution breakers replaced through December 31, 2021.



New vacuum breaker replaces oil breaker

## TRANSMISSION SYSTEM INTELLIGENCE

### SYSTEM INTELLIGENCE

The System Intelligence program improves reliability for customers by helping avoid unplanned outages and reduce duration / impacts when outages occur.

- Florence Dupont – Marion line – Installation of remote switch that enables faster restoration for over 4,000 customers.

### KEY ACCOMPLISHMENT

Installations of intelligent communication equipment have been completed at **28** South Carolina substations



New remotely capable switch installation



## ANIMAL MITIGATING FENCES – MULTIPLE LOCATIONS

- Installation of the fences mitigates animal related outages for approximately 70,000 customers
- Fences have been installed at 5 substations including:
  - Peach Valley Tie (Spartanburg)
  - Anderson Tie (Anderson)
  - Belton Tie (Anderson)
  - Augusta Rd (Greenville)
  - Eastover (Greenville)



# EASTOVER RETAIL



# ANDERSON TIE



# DISTRIBUTION – 2021 PROJECT HIGHLIGHTS

Leslie Clark

Project Director, Customer Delivery Carolinas Major Projects

Kenneth McCraw

Director, Customer Delivery Carolinas Project Management

Eugene Moore

Sr Project Manager, Customer Delivery Distributed Energy Group

Clifton Cates III

Manager, Customer Delivery Carolinas Asset Management



## INTEGRATED VOLT/VAR CONTROL (IVVC)

### SUBSTATIONS

**100%**

Assessment

**93%**

Engineering

**15%**

IVVC Ready  
Substations

### CIRCUITS

**60%**

Assessment

**56%**

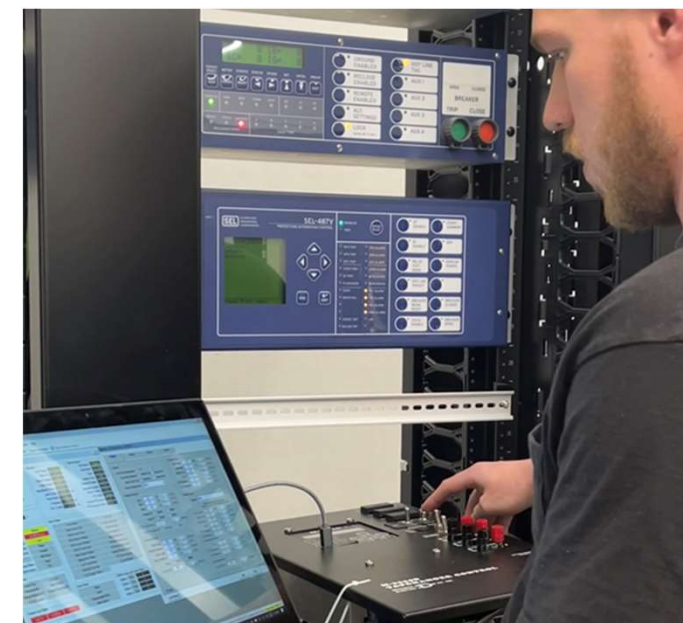
Engineering

**27%**

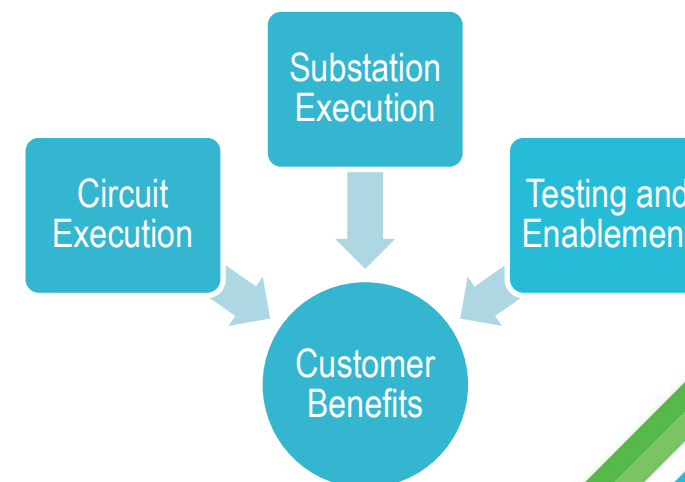
IVVC Ready  
Circuits

### TESTING AND ENABLEMENT

- Software and reporting infrastructure upgrades are taking place to facilitate system operations and tracking of voltage reduction.
- The project is on track to begin testing completed substations in 2022 and enabling substations to start delivering capacity and energy savings on approximately 10% of targeted substations in 2023. Ramping up to 100% in 2025.



IVVC LAB



## UNDERGROUND SYSTEM AUTOMATION

### DOWNTOWN GREENVILLE, SOUTH CAROLINA PROJECT

- Improves reliability for thriving Greenville downtown/business center
- 13 vaults completed as of December 31, 2021
- Project has included installations of:
  - Switchgear relays for SCADA and self-healing capabilities
  - Ductbank infrastructure
  - Primary circuit extensions
  - Fiber networks



**NEW MANHOLE INSTALLATION**

Duke Energy - General Information for Discussion



## UNDERGROUND SYSTEM AUTOMATION

### PRIMARY CABLE PULLING



### DUCTBANK INSTALLATION





# UNDERGROUND SYSTEM AUTOMATION

## VOLTAGE SENSORS



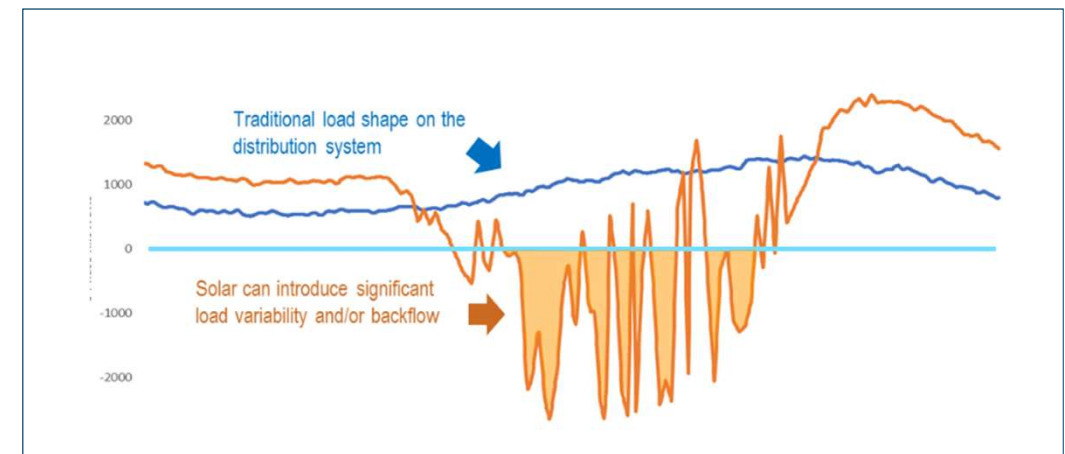
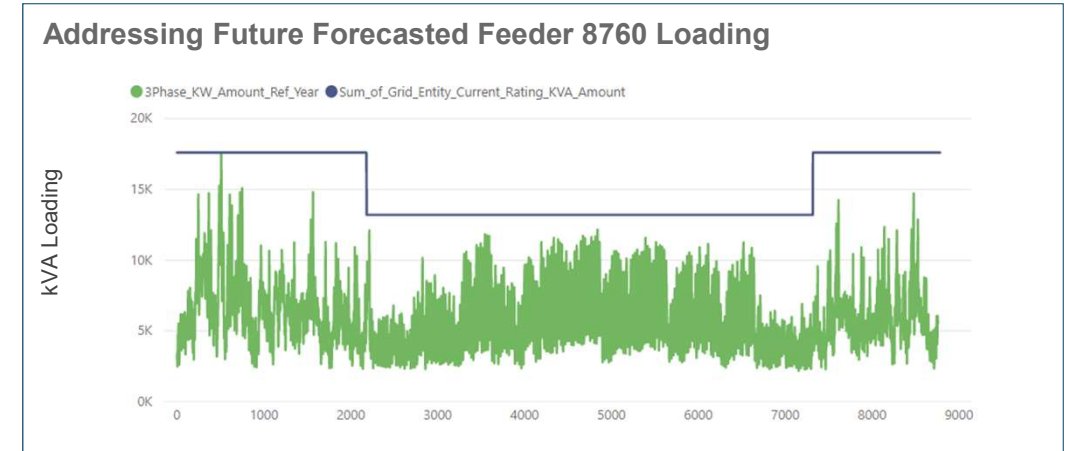
## SWITCHGEAR





## ADVANCED DISTRIBUTION PLANNING ("ADP") TOOLSET

- Leverage the massive amount of data that Duke now collects to gain and share a more accurate understanding of our system
- Evaluate a range of hourly circuit forecasts, which analyze a broad range of possible future growth patterns and customer programs
- Automate the load-flow analysis to calculate network deficiencies and intelligently solve those deficiencies with both “wire” and “non-wire” alternative solutions
- Evaluate Generation and Transmission stacked benefits for Distribution-sited distributed energy resources (including energy storage)



## DATA INFORMED APPROACH TO INVESTMENTS

### FULL-SCALE DEPLOYMENT UPDATE

The Advanced Distribution Planning (“ADP”) toolset achieved full-scale deployment to distribution planners in the Carolinas in August 2021.

- Training on tools and processes
- Traditional solutioning such as reconductoring, phase taps, etc.
- Solutioning alternatives on circuits and groups of circuits
- Detailed power flow analysis supporting storage and other use cases for distributed energy resources
- Circuit segmentation capabilities to scope recloser placement
- Data analysis and visualization tools
- Impact assessments for new customer load profiles (i.e., rooftop solar, electric vehicles [EVs], customer programs)
- Recognize opportunities for large new load concentrations (i.e., heavy duty electric vehicle depots)



# DISTRIBUTION – 2022 PROJECT HIGHLIGHT

Sam Spilman

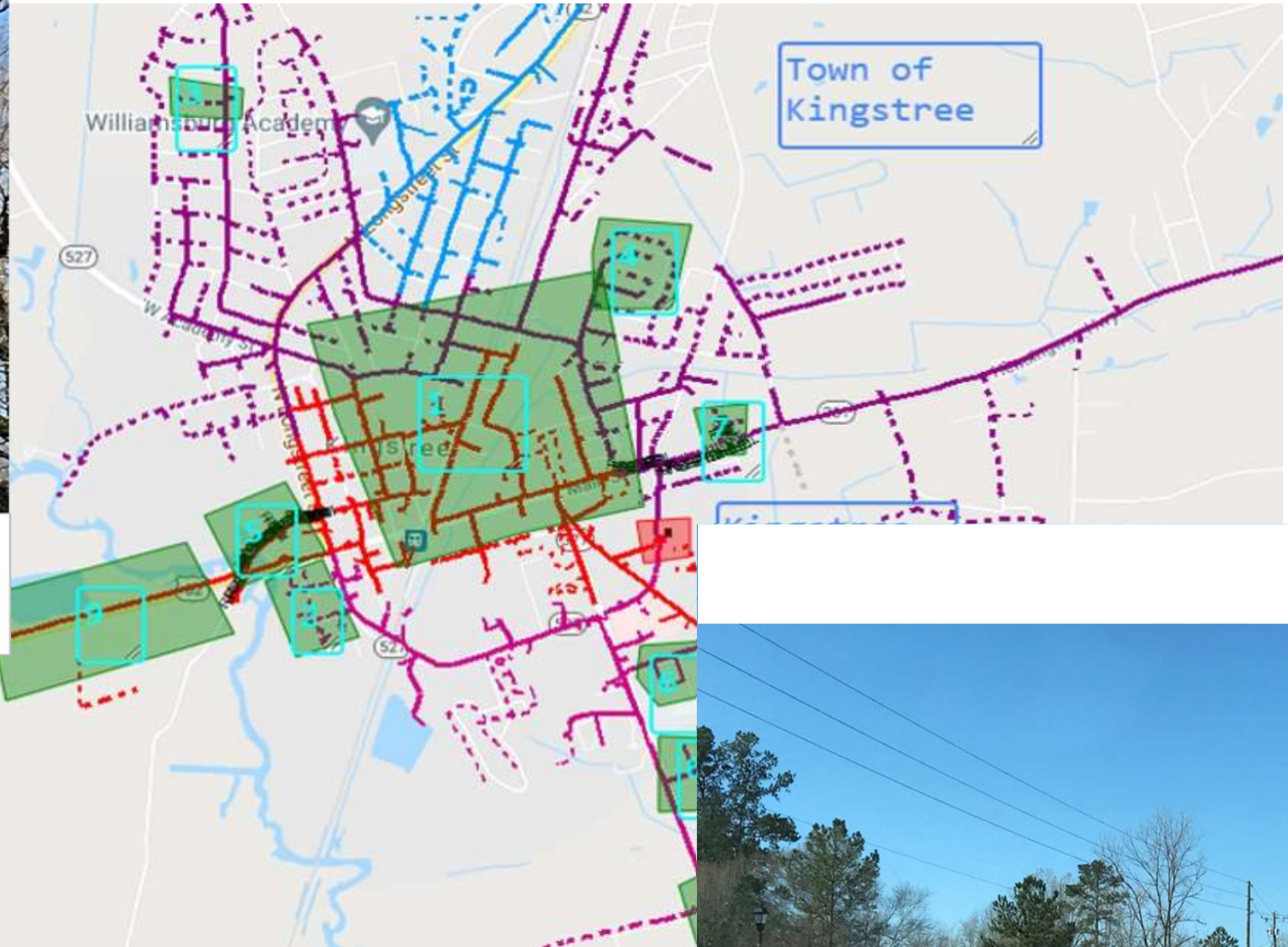
Director, Customer Delivery Carolinas Project Management



## DUKE ENERGY PROGRESS - KINGSTREE SUBSTATION



Circuit Reconductor



Duke Energy - General Information for Discussion



## DUKE ENERGY PROGRESS – TOWN OF GREELEYVILLE



Greeleyville OH Rebuild

Duke Energy - General Information for Discussion



Old Greeleyville Rd Relocation

## DUKE ENERGY PROGRESS - KINGSTREE SUBSTATION

### SELF-OPTIMIZING GRID

Reclosers will provide intelligence and control while enabling the ability to automatically reroute power around trouble areas to quickly restore power to the maximum number of customers.

### TARGETED UNDERGROUNDING

Converting overhead power line segments to underground can maximize the number of outage events eliminated for customers served by those segments as well as customers upstream.

### LONG DURATION INTERRUPTIONS

This reconductoring is designed to improve the reliability in parts of the grid where the duration of potential outages is expected to be much higher than average.

### FUSE REPLACEMENTS

Replacing one-time use fuses with automated lateral devices, which are capable of intelligently resetting themselves for reuse, eliminates the unnecessary use of resources.

In addition to the GIP work described above, load growth and reconductor reliability work will also be completed for customers served by this substation.



# QUESTIONS AND WRAP-UP

Justin Brown  
Director, Planning & Regulatory Support





# THANK YOU FOR ATTENDING.

The Virtual Forum has ended.

# 2021 South Carolina GIP Virtual Forum

## Post-Event Survey

\* Required

1. On a scale of 1-5, how well did this status report and virtual forum enhance your understanding of the progress made in Duke Energy's South Carolina GIP through 2021?

1 2 3 4 5  
☐ ☐ ☐ ☐ ☐

2. On a scale of 1-5, how satisfied are you with the opportunity to provide feedback and dialogue with Duke Energy during and after this virtual forum?

1 2 3 4 5  
☐ ☐ ☐ ☐ ☐

3. What changes would you suggest for future meetings?

4. What GIP topics, programs or projects would you be interested in engaging on or hearing more about in future sessions?

5. What grid-oriented programs or projects would you recommend Duke Energy investigate for future grid investments?

6. Name and Contact Information: \*